Journal of Rural Studies xxx (2016) 1–8

Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud

Broadband and the creative industries in rural Scotland

Leanne Townsend [a, *], Claire Wallace [a], Gorry Fairhurst [b], Alistair Anderson [c]

[a] School of Social Science, King's College, University of Aberdeen, AB24 3QY, United Kingdom
[b] Fraser Noble Building, University of Aberdeen, AB24 5UA, United Kingdom
[c] Centre for Entrepreneurship, Aberdeen Business School, The Robert Gordon University, Garthdee Campus, Garthdee Road, Aberdeen, AB10 7QE, United Kingdom

ARTICLE INFO

Article history:
Received 1 August 2014
Received in revised form
24 August 2016
Accepted 6 September 2016
Available online xxx

Keywords:
Broadband
Creative
Economy
Rural
Digital

ABSTRACT

The creative industries potentially contribute much to the social and economic viability of rural regions. This paper explores the role that broadband connectivity plays in the development of professional and creative practices. In particular, we explore the extent to which broadband connectivity can reduce the penalty of distance for rural creative practitioners, and equally, how a lack of connectivity impacts upon the development of the rural creative economy. Our findings suggest that access to broadband of at least 2 megabits per second, download speed, had become crucial for those working in the creative sector at the time of the fieldwork (this minimum critical speed is now likely to be faster). A lack of adequate access may have a negative impact upon rural communities through prompting out-migration to areas with better digital connectivity.

1. Introduction

The creative industries are an important business sector in rural areas and are seen as a major area of economic growth in the UK, although the majority of research on creative production has focused on an urban context (Gibson, 2010; Sorensen, 2009). The countryside attracts creative and artistic individuals, who often form Small and Medium Sized Enterprises[1] (SMEs), many of which are Micro-Enterprises or single-person enterprises, often becoming part of the pluri-active economy of rural areas (White, 2010). Indeed, as pointed out by Galloway (2007), it is micro-enterprises which dominate the economy in rural areas, and those situated in the creative sector play an important role in the development of rural economies more broadly. The creative industries are also an important sector in terms of tourism, adding to the vibrancy of the countryside as a place to visit. Creative practices are important to the quality of life of those living in rural areas because they afford expression of identity and social cohesion (Kazana and Kazaklis, 2009; EU Commission, 2009). Digital technologies, particularly those enabled by broadband, are playing an increasingly important role in creative practices (Bell and Jayne, 2010). Unfortunately many rural areas still have inadequate (or no) broadband connectivity (Townsend et al., 2013) – in the UK as well as in many other parts of the world.

This paper considers the role of broadband and its applications in the development of rural creative economies. There is little work that has explored the value of digital technologies for rural creative practitioners (Anderson, 2010) – something that this paper aims to address. Recent work has highlighted the idyllic nature of the rural lifestyle as a motivation for creative migration (Herslund, 2012). We add to this work by contrasting the notion of a rural idyll with work that points to the penalties of rural living and working. We then discuss the role of broadband and its applications in supporting the creative industries in rural areas, drawing on globalisation discourses and the concepts of time-space compression. From the literature we derive our research questions: *1. What are the roles of broadband access for rural creative practitioners?* and *2. Can broadband connectivity alleviate the penalty of distance for rural creative practitioners?* We then outline our methodology and present an analysis of data collected during qualitative interviews carried out across rural Scotland with rural creative practitioners. We conclude

* Corresponding author.
E-mail addresses: l.townsend@abdn.ac.uk (L. Townsend), claire.wallace@abdn.ac.uk (C. Wallace), g.fairhurst@abdn.ac.uk (G. Fairhurst), a.r.anderson@rgu.ac.uk (A. Anderson).

[1] The European Commission defines Small and Medium Sized Enterprises (SMEs) as those which employ 250 employees or fewer and with an annual turnover of €50million or less; Micro-Enterprises are those with 10 employees or fewer, and with an annual turnover of €2million or less.

http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

by proposing that rural digital development, including the rollout of broadband infrastructures, should be a UK Government priority in order to support the rural creative economy.

2. The rural creative economy

The creative sector when considered in its entirety has a very broad scope, including, for example, businesses working in crafts, music, performance, film, advertising and video games (for an in-depth discussion of the definitions and breadth of the creative industries see the British Council's Mapping of the Creative Industries Report, 2010). For the purposes of this paper we follow the Department of Culture, Media and Sport's (DCMS) definition as:

> *"activities which have their origin in individual creativity, skill and talent, and which have the potential for wealth and job creation through the generation and exploitation of intellectual property. These … include the following key sectors: advertising, architecture, the art and antiques market, crafts, design, designer fashion, film, interactive leisure software, music, the performing arts, publishing software and television and radio"* (DCMS Creative Industries Task Force, 1998, p10).

This differs somewhat from the increasingly popular notion of the creative worker offered by Richard Florida's thesis on the *creative class* (Florida, 2002) in which creative work is more broadly defined, encompassing not only those kinds of creative practitioners outlined in DCMS's definition, but also knowledge workers such as those working in banking, law and information technologies. This conceptualisation of creative work is too broad for the purposes of this paper, which draws on research with practitioners such as artists, musicians and filmmakers. We highlight the association of the creative industries with self-employment, entrepreneurism, micro-enterprises and SMEs (Felton et al., 2010), something we have found in our own research in rural Scotland.

The creative industries in Scotland have experienced significant recent growth – between 2000 and 2010 gross value added (GVA) increased by 25% in the creative sector in Scotland, compared with only a 14% increase in the economy as a whole (Royal Society of Edinburgh, 2014). This increase in Scotland has been higher than in the UK as a whole, with GVA in the Scottish Creative Sector increasing by 15.6% since 2008, compared with an increase of only 5.4% across the UK-wide Creative Sector. The strength of the UK's creative sector is globally recognised as something that may help push economic recovery (Royal Society of Edinburgh, 2014).

Much writing on creative production has focused exclusively upon the urban context (Gibson, 2010; Sorensen, 2009) – a focus which creates an urban-centred *"imaginary geography of creativity"* (Gibson, 2010). This is, to some extent, influenced by Richard Florida's *creative class* thesis (Florida, 2002) which examined the rise of knowledge workers in-migrating to and clustering in city hubs, a phenomenon which, according to Florida, promised innovation and economic growth – "*the* salient feature of contemporary post- industrial capitalism" (Gibson, 2010). Florida's *creative class* has been embraced whole-heartedly by policy makers responsible for encouraging the economic development of urban regions (Brennan-Horley, 2010) but is rarely referred to in rural development discourses. It has been argued that applying ideas about the *creative class* outside of the US context is inappropriate given cultural and economic differences found in other national contexts (Oakley, 2004). However, the focus on creative clusters precedes Florida's contribution. For example, in 1999 Leadbetter and Oakley referred to cultural entrepreneurs as being densely interconnected within cities or regions. The literature, focusing almost entirely on urban regions, suggests that creative economies require tight-knit networks (or clusters) of knowledge and resource exchange to thrive, something which might be harder to achieve in more sparsely populated areas (Felton et al., 2010). This may explain the lack of creative industry promotion in rural development strategies. Here we note the importance of virtual communities of practice (such as networks of professional creatives) which are not always bound by geographical location, and are enabled through digital technologies (Wenger et al., 2009).

An urban bias has resulted in academic discourse often entirely ignorant of the creative potential of rural places. Some recent research has focused on creative industries in regions outside of urban centres, including rural and remote regions (e.g. Eversole, 2005; Markusen, 2007; Wojan et al., 2007; Bell and Jayne, 2010). For example, Mayes (2010) found a rich and vibrant creative and cultural scene in a remote rural community in Australia, leading him to question his own urban bias and that of his contemporaries. Creative industries in rural areas of the UK have much to offer their local economies: they can contribute to tourism, adding to the vibrancy of the countryside as a place to visit. Indeed, the characteristics of rural places can be marketed through the creative and tourism industries, such as is the case with the lochs and glens of Scotland, and the Blue Ridge Mountains of North Carolina (Anderson, 2010) – landscapes which can inspire creativity in local artists, as well as provide subject matter for creative products which connect with local identities and appeal to tourists and locals alike. Creative practices might also enhance the social sustainability of rural communities; they are important to the quality of life of those living in rural areas because they afford expression of identity and social cohesion (Kazana and Kazaklis, 2009; EU Commission, 2009; McHenry, 2011).

Despite the urban bias found in the literature, creative practitioners *do* operate from rural areas, often having been attracted to relocate there from more urban settings. Rurality offers qualities that cannot be found in urban environments, particularly in terms of landscape, tranquillity, and notions of a more laid back lifestyle and tight-knit community life. Yet rural regions also present challenges to those who live and work there. This tension is now explored in more detail.

3. Rural idyll or rural penalty?

Across Europe, the populations of rural areas are ageing faster than those of urban areas. Long-term migration patterns of young adults leaving rural areas for urban centres of education and employment continue in many rural areas. The in-migration of adults in mid-life or following retirement contribute to the older age profiles now common in many rural areas (Townsend et al., 2013; Philip et al., 2012). Rural areas in the UK are also characterised by in-migration of professionals seeking a different quality of life – something typically restricted to suburban areas across the rest of Europe, but widespread in rural Scotland and the rest of the UK (Jedrej and Nuttall, 1996). This means that rural communities can be both relatively rich and relatively poor (Office for National Statistics, 2011). Amongst these in-migrants are those belonging to the creative sector, seeking rurality for quality of life and creative inspiration and bringing their enterprises with them when they relocate (Bosworth, 2008; Roberts and Townsend, 2015; Drake, 2003; White, 2010). We acknowledge along with others however (McGranahan et al., 2011; Hoyman and Faricy, 2009) that empirical evidence for the influence of creative talent on local economies is limited; further we note that although we observe a movement of creative people to rural areas in Scotland, many creative practitioners do not have the luxury of relocating for lifestyle reasons and may instead be bound (or more influenced) by the location of jobs, property prices and attainable income levels.

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

The ideas posited by Richard Florida in his creative class work can equally be applied to a rural setting: creative people are attracted to certain features of environments; for many it is the promise of natural amenities, rich cultural heritage, a strong sense of community and a better quality of life that inspires relocation to rural settings (McGranahan and Wojan, 2007; McGranahan et al., 2011). Such features of rural areas, which have been overlooked in the urban bias of Florida's work (2002) and the wave of creative class proponents (whether academic, media or policy based) that followed, can potentially offer creative practitioners the kinds of inspiration, natural beauty and tranquillity that cannot be found in urban settings.

Yet this notion of a rural idyll is tempered by challenges that rural creative practitioners face. They are remote from the central hubs of activity and their professional networks and it is not easy to maintain visibility in one's sector. Added to this are the challenges faced by rural inhabitants and workers more generally. Economic survival can be problematic for rural businesses struggling to compete with businesses in urban areas, with many having diversified in order to remain viable. Compared with urban economies, high levels of aspiration and entrepreneurship in rural areas do not necessarily equate with high levels of growth and wealth (Burgess, 2008).

Accessibility and mobility are further issues: rural dwellers can be remote from places of work, education and leisure, leaving them both physically and socially isolated. Further, transport infrastructure is more limited given geographical distance from urban centres (Velaga et al., 2012). Rural areas, remote rural areas in particular, are also characterised by poor broadband infrastructure, something that impacts negatively on businesses, unfortunate given the potential of technologies to alleviate the rural penalty (Townsend et al., 2013; Philip et al., 2015). These issues are of particular concern in Scotland, where 18% of the population live in rural areas, with 12% living in accessible rural areas and 6% in remote rural areas and very remote rural areas. This contrasts sharply with the fact that the 98% of the landmass of Scotland is considered rural, whereas urban areas account for 82% of the population but only 2% of the landmass (Scottish Government, 2012). This is concerning given that broadband connectivity is problematic in many rural and suburban areas (Townsend et al., 2013) – precisely those areas that are typically targeted by 'lifestyle' in-migrants including those based in the creative industries.

These issues mean that some creative practitioners may face pressures to relocate from rural areas to urban centres. On the one hand, creative practitioners are drawn to the beauty and tranquillity of rural settings; on the other, they experience challenges that leave them feeling disconnected from knowledge and both professional and economic opportunities (Gibson et al., 2010). Given the potential for creative practitioners to contribute to rural economies, it is important that scholars identify the factors that might alleviate some of the penalties associated with rural living and working. In this paper we focus on one key factor – the availability of broadband connectivity and its role in supporting the rural creative industries.

4. The role of broadband in the creative economy

Distance can be overcome with technology, allowing creative practitioners to connect with other geographies and professional hubs (Warren and Evitt, 2010) – technology has been touted as heralding the "death of distance" (Schwanen and Kwan, 2008). As early as 1991 it was recognised that the rapid pace of technological developments would enable firms traditionally located in urban centres to relocate to where they want to be. Likewise, enterprises could operate from rural and remote areas where once this would not have been viable (Heenan, 1991; Grimes, 2003; Malecki, 2003). Here we draw on Castells *network society,* in which technology allows for the dissolution of space and time constraints: "[T]he new communications system radically transforms space and time, the fundamental dimensions of human life. Localities become disembodied from their cultural, historical, geographical meaning, and reintegrated into functional networks …" (Castells, 1996, p357). In Castells' network society, connectivity leads to new forms of work, and new virtual geographies that form new communities of exchange that are not dependent upon physical space (Burnett and Marshall, 2003).

Technological revolution therefore entails the "shrinking of the world" (Agnew, 2001, p133), a notion that has been called *time-space compression* – the breakdown of traditional temporal and geographical spatialities regarding the movement of people, goods, capital and culture (Burnett and Marshall, 2003). As early as 1962 there was some sense that technology would bring people and economies closer together, in the form of a "global village" (McLuhan, 1962, p48). Narratives on globalisation often suggest that such processes favour the urban, connecting urban centres with one another whilst at the same time leaving more 'conservative' rural areas behind. Narratives have also focused on the benefits for well connected locales which emphasise speeds of technology – another area of the literature which has somewhat neglected the rural (Agnew, 2001).

Yet it has also been argued that globalisation can appropriately refer to rural economies, especially where they represent meaningful linkages with urban centres. Such linkages often shift the economic identity of rural regions from those emphasising, for example, farming and fishing, to those emphasising tourism, recreation, gourmet food and cultural industries and to some extent linked also to the gentrification of rural areas (Gibson, 2002). Here then, we see the potential of technology in empowering enterprises in rural areas where once these would have been geographically disconnected from professional networks and peers. Time-space compression can potentially produce economic similarities across places (Agnew, 2001), further facilitating economic survival of creative enterprises in rural areas that have not traditionally had strong creative economies.

Since the emergence of Web 2.0 in the late 1990s – i.e. the transition in Internet use from mostly viewing static pages to more interactive use including the generation of content by users themselves (DiNucci, 1999), the Internet has been responsible for a huge expansion of cultural production in comparison with more traditional forms of media such as television (Burnett and Marshall, 2003) and has enabled a broader cross-section of society to take part in this cultural production. Amongst these are entrepreneurs and business owners seeking to engage with popular information and media channels in reaching broader audiences and potential clients. The Internet has generated a massive increase in demand for cultural production, which itself has led to growth in the creative economies. In 2003, Burnett and Marshall had already identified that the shifting forms of information production and consumption would mean the redefinition of the production of film, music, radio, newspapers and books, blurring the distinctions between forms of old media as various forms of new media develop. They call this "*convergence*, the blending together of the media, telecommunications and computer industries, and the coming together of all forms of mediated communication in digital form" (2003 p1). Indeed, embracing digital technologies may be more crucial for those in the creative industries than in some other industries, because of the ways in which traditional creative processes are altered by technological development. The use of websites and social media are favoured channels for self-promotion and networking with potential clients, suppliers and collaborators. The distribution of creative content online is becoming the preferred

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

approach amongst creative practitioners (Roberts and Townsend, 2015). Some creative industries are more technology-driven than others; a video game producer will typically depend upon digital tools more than a wood carver. Yet as globalisation advances, arguably all rural businesses need to embrace the digital age and find new avenues to reach their client base and professional networks (Winters and Martins, 2004).

Digital technology offers new potential for creative practitioners wishing to operate from rural areas. Yet, as mentioned previously, rural areas in the UK and further afield are characterised by poorer broadband infrastructure and connectivity relative to their urban counterparts (Townsend et al., 2013) – a problem with a number of negative implications for rural communities and the rural economy (Ofcom, 2011; Skerratt and Warren, 2003). The problem of unequal access has been recognised for some time - in 2003, Skerratt and Warren described poor broadband in rural areas as "the new digital divide" (page 484). This problem is being addressed by the EU Commission which aims to realise broadband for all by 2015, and UK Government who have allocated funds of £530 m within the lifetime of the current parliament to roll out broadband to virtually all parts of the UK and provide the best superfast broadband network in Europe (BDUK, 2011). Even where broadband is adequate, rural areas are typified by poor adoption of digital technologies (LaRose et al., 2007), which arguably correlates with other demographic features of both poor adoption and rural populations, i.e. ageing and low socio-economic status populations (although over time, older groups are becoming more comfortable with Internet use, as they are increasingly likely to have been introduced to it at a younger age). This might also be true of some rural creative practitioners who as a result may be missing important opportunities available to those engaging in online spaces. Therefore, the impacts of technology for creative practitioners in rural areas are negative as well as positive. Poor fixed and mobile broadband connectivity can place further penalties on those trying to run businesses from remote and rural locations (Schwanen and Kwan, 2008), subsequently impacting upon the potential of technology to compress space and time for geographically isolated practitioners, and locate them in the global marketplace promised by early interpreters of the technological age (McLuhan, 1962; Castells, 1996).

This paper reports research in which rural creative practitioners were interviewed to explore their perceptions of the value of broadband and its applications in their business activities and creative practice. The research was carried out in remote areas of rural Scotland, in Aberdeenshire and the Highlands and Islands. Many of our participants had inadequate, or no, fixed or mobile broadband connectivity – a result of poor digital infrastructure in their areas as opposed to personal choice not to sign up to a service. Consequently, our analysis seeks not only to understand the value of broadband, but also to understand the penalties associated with inadequate broadband connectivity. Firstly, we seek to understand the role that access to broadband has for the development of the rural creative economy by asking: *1. What are the roles of broadband connectivity for rural creative practitioners?* Secondly we reflect on the notion that connectivity provides a solution to the penalty of distance experienced by those working in rural and remote rural locations, by asking: *2. Can broadband connectivity alleviate the penalty of distance for rural creative practitioners?*

5. Methodology

The research reported in this paper forms part of a large interdisciplinary project, undertaken in rural Scotland, which explores the role of broadband for rural creative micro-enterprises and the potential of satellite broadband as an enabler in remote rural locations. We draw on qualitative in-depth interviews with rural creative practitioners to investigate the various roles of broadband and its applications for their business and creative practices. The interviews explored the impact of inadequate or non-existent access to fixed (i.e. wired) broadband infrastructure. Fifteen interviewees, representing a diverse range of activities associated with creative industries, including fine art and sculpture, music, film production, radio content production, photography, crafts and design took part in the research. Most interviewees worked from home, typically as sole traders. A few had a small number of employees (one or two at most), but none met the size criterion for SME so all are classed as micro-enterprises.

The Scottish Government uses an urban-rural classification based on population size and distance (drive time) to centres of population of 10,000 or more. The eightfold definition categorises non-urban areas as either accessible rural, remote rural or very remote rural. Rural areas account for approximately 95% of the Scottish land mass, remote rural areas for almost two-thirds. 18.1% of Scottish residents reside in rural areas with 11.6% classed as living in accessible rural, 3.4% in remote rural and 3.1% in very remote rural areas. Two of our interviewees were located in "very remote rural" areas, 7 of the 15 were located in "remote rural" locations and the remaining 6 interviewees were located in "accessible rural" areas. 12 of our 15 interviewees had relocated to rural areas from other (usually urban) areas, and although their reasons for relocating were not the focus of the research, these often emerged in the interviews so are explored at some points in the discussion of findings that follows.

Ethical approval for the study was awarded by The College of Arts and Social Sciences Ethics Committee at the University of Aberdeen. Interviews occurred either in the home or workplace. With the consent of participants, interviews were recorded then transcribed and uploaded into Nvivo, which was employed as an organisational tool. The data were analysed independently by two researchers using Framework Analysis. Framework Analysis facilitates policy- related analysis, working across multiple researchers and research fields. Researchers agreed on a coding frame based on previous literature and a preliminary analysis of the data. Interviews were coded using this framework, although new themes were incorporated as they emerged.

6. Analysis and discussion

In this paper we seek to understand the ways in which creative practitioners in particular use (or wish to use) the Internet, and the value of this for their creative practice and the sustainability of their businesses. We highlight the situation of our interviewees – all perceive their connectivity to be inadequate. They all had connections with download speeds lower than 2 megabits per second (2Mbps) which was both the minimum download speed the British Government declared that 95% of UK households should have access to (BDUK, 2011) and, at the time of the fieldwork, commonly agreed as the minimum speed for broadband Internet – i.e. the minimum speed required for engaging in Web 2.0-type activities such as streaming television and video content and uploading video files (Townsend et al., 2013). Since this fieldwork was conducted however, a higher minimum speed has been suggested for participating in such activities. This is not least because the quality of such services has increased with higher definition television and film products being the norm, with these requiring more data to download and hence faster download speeds. Ofcom currently states that a speed of at least 10 Mbps is required to deliver a satisfactory user experience.[2] It is worth noting that all

[2] http://consumers.ofcom.org.uk/news/fixed-bb-performance/.

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

interviewees had different notions of what constitutes adequate broadband speeds for their purposes, although all of these are above 2 Mbps. The following analysis is structured around our two research questions.

6.1. The roles of broadband connectivity for rural creative practitioners

Our research shows that, for rural creative practitioners, access to broadband connectivity has become crucial for the growth and sustainability of their businesses, and a lack of adequate connectivity is increasingly problematic: "it's … essential for the growth of my business to be able to access tools [software and online applications] that are available to everyone else, but you can't access them" (Interviewee 2). For those of our interviewees who are incomers to the place in which they live and work (totalling 12 of the 15 interviewees), a promise of good broadband connectivity made by Internet providers was instrumental in their decision to relocate to a more rural location, yet for some the technology was either not as indicated by broadband Internet providers, or expected improvements to their local broadband infrastructure did not progress at a pace commensurate to other parts of the UK: "If there hadn't been broadband on offer, I don't think we would have considered it. But as the broadband has stood still over seven years … gradually possibilities have diminished" (Interview 9). For Interviewee 9, the widening divide between broadband speeds in his local area and those in other parts of the UK has meant that he is now unable to participate in as many collaborative opportunities as he once could. For another interviewee the frustrations associated with poor connectivity mean that she is unable to market her art as well as she could in an area with better digital connectivity: "If I've been at the computer all day with build up and frustration, you can imagine the stress that builds up – I'll do what I have to do and there's just no energy left for the extras like updating my website or doing something with Facebook. It's just such a negative thing" (Interview 13).

Overall the most important role of broadband connectivity for our interviewees is connectivity to clients and to professional networks and peers: "broadband is very important to my work, just fundamentally being able to communicate with the people that I'm working with" (Interviewee 3), and "Skype is really important … an artist just had an interview with "Sculpture" magazine – trying to conduct it over Skype was pretty horrific" (Interview 14). This fits with Castell's notion of a network society (Castells, 1996). Particularly for entrepreneurs and businesses based remotely, the network seems crucial for business survival, something we have found in our previous research (Townsend et al., 2016). Not only do our interviewees need to be able to connect with those they are working with or for, they also need to stay abreast of what is happening in their professional field, to remain viable in their industry: "I need to see what competitors are doing, what new things are going on" (Interview 2). Staying "in the loop" can be a challenge, given the remote and isolated situation of many of our interviewees. Broadband connectivity is essential given they may not be able to network in person in the way their urban counterparts can by, for example, attending industry events and exhibitions. The creative practitioners aim to use tools online to research the competition and stay up to date with developments in their professional field but are often unable to do so: "I can't watch Youtube because it just cuts off" (Interviewee 2).

Our findings reveal that local communities in rural areas can treat creative practitioners and organisations with mistrust or contempt, failing to appreciate the economic benefits they bring to rural areas. This can be problematic if the local community is a potential audience or client base, and is important in terms of the practitioner or organisation feeling a sense of belonging in the community they work from: "I think the development of social media has improved how people can perceive what we're doing. The [organisation] blog gives people an inside look at what's actually going on here … I think for the community it allows them to see behind the scenes and to maybe discover that art isn't quite as scary as it could be perceived … I think it [makes the organisation] more accessible to the community" (Interview 14).

The creative practitioners indicated a number of interesting applications of broadband that they are either already engaging with, or would like to be able to use but are currently unable to (due to inadequate connectivity). For example, a freelance radio producer would like to broadcast content live online, a musician engages with a site called "stageit.com" that (when connectivity permits) allows her to stream concerts and performances from her home in real time. A music producer/film maker would like to be able to undertake real time collaborative creative production with peers in urban centres. These represent ways in which broadband applications could be used not just to support, but to develop the scope of the rural creative industries. Marketing increasingly occurs online for the creative industries and is particularly valuable for those working remotely to reach a broader audience or market. One interviewee (a musician) markets through a website called Reverbnation, a professional networking site for musicians: "People have found us directly through Reverbnation … you can get a conversation going back and fore with people … you've kind of got to play the game just to get yourself out there" (Interviewee 5). The creative practitioners noted the particular value of Youtube as a means of promoting their creative activities, especially for those involved in music or film. Clients and collaborators need to be able to see and judge the work of a potential practitioner before considering employing their services. Indeed, our interviewees feel that their clients expect an online presence so that they can make informed decisions about whom to trade with – anything less is considered unprofessional especially for those working in the creative sector. Marketing one's own work online - particularly through social media – empowers creative practitioners. In some cases it cuts out the need to employ the services of galleries or agents, and hence hefty commission rates can be avoided. The Internet, therefore, can benefit individual artists but could be detrimental in the long term to agents such as galleries.

Broadband connectivity is vital for the connectivity, self-promotion and marketing of rural creative enterprises operating from remote geographical areas, typically enterprises that depend upon applications that require download speeds of considerably more than 2 Mbps. Our findings illustrate the value of broadband for rural economic activity and some of these findings are likely to apply in other industries working in and from rural areas, such as food and drink or tourism businesses. Rural enterprises need to be able to participate digitally in order to be a part of the network society proposed by Castells, and to reach national and global, as opposed to limited local, markets. Our findings illustrate the ways in which broadband applications can both support the existing activities of rural creative enterprises, and also develop new markets and innovative practices which might strengthen local creative economies as well as rural economies more generally.

Creative practice itself can be impacted by engaging with broadband and its applications. For example, in terms of inspiration derived from connectivity to others in the field: "It just would be nicer to have better connectivity with people and know what they are doing as well because we all inspire each other, don't we?" (Interviewee 6). This makes reference to the importance of communities of practice which are often not geographically bound and often play out online. Online tools can be utilised in creative ways to raise one's profile, such as the musician interviewee who has

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

uploaded a video to Youtube of her band performing in a cupboard – a means of expressing a sense of financial imprisonment, and a plea for donations to crowdsource funds for a tour of America to broaden their audience base. Yet we have found that inadequate connectivity stifles this type of creativity: "I did quite a bit of work using broadband as a medium a few years ago … created multimedia work that still gets written about in academic circles … I can't really get involved with that kind of thing anymore with any kind of certainty" (Interviewee 9). Since conducting the interviews, one of our interviewees (a musician and music producer) has had satellite broadband installed, and has subsequently been able to produce an award-winning album by connecting online with collaborators in other parts of the UK. When digital connectivity works well, it can allow rural practitioners to contribute to their communities of practice and prevent the rural disconnection from knowledge and opportunities as feared by Gibson et al. (2010).

Despite challenges resulting from poor connectivity, our interviewees had developed a number of coping strategies. For example, one interviewee compared his current poor connectivity with a previous, better situation telling us: "I'd be sending [via file sharing platforms] large files to people, whereas at the moment I copy them onto CD, stick it in a jiffy bag and take it on one of the three buses to [the nearest post office]" (Interviewee 12). One of our music producers, in order to show clients previews of film material, has to upload these in low quality, which affects picture quality and looks unprofessional (but at least allows him to collaborate with clients to some extent). Others save up pending online work (requiring higher bandwidth) and travel to the nearest city to do that work. One interviewee is only able to connect to the Internet via mobile devices, and only in very limited locations, the nearest of which is half way up the large hill behind his home: "I tend to go down the road but if I'm in the mood I'll go up the mountain" (Interviewee 3). For those attempting to work online at home, there is an understanding of the need to build in extra time: "you will always say "it will be with you Monday" instead of Friday, which means you've got the weekend for it to be uploading. Just silly tricks like that" (Interviewee 10), and: "I leave the room, go and do other things and come back half an hour later and hopefully the [music] video has gone up on Facebook. Maybe that's a normal thing for people, I don't know" (Interviewee 5).

6.2. Broadband and the penalty of distance

Our findings reveal that, in line with Warren and Evitt (2010) findings, broadband connectivity can alleviate the penalty of distance associated with being based in remote rural locations. For some interviewees, connecting with an international network is made more possible through the Internet. A rural arts organisation curator stated: "We've got about 2000 people on Facebook that follow us – we've got a huge following in Scotland but it's international too … people often approach us because they've been following what we've been doing and we've made another link" (Interview 14) and for the interviewee who, regarding a local music venue, suggests that online connectivity may go considerable distances in connecting disparate communities of interest:

> "Typically the [performers] that come to the [venue] come from West Virginia or North Carolina. And often they live within a hundred miles or so of a particular town. And that town is noted for – maybe it's got academies, it's got professional musicians, it's got great venues. And musicians congregate there, so you get a certain word of mouth "hey when you go to [Scotland] you must go to this [venue] place" – people google the [venue], and then they tell us "I am X – if you go onto this website you'll be able to see and hear me doing my music. Can I come and play?". And so the web is used in that way, so we can see performers and actually book them without ever going to a live venue. So that's really, really useful" (Interview 15).

These expanding networks, made possible by connecting online through email and social media, allow creative practitioners to belong to creative clusters that form in online places as opposed to physical places such as the urban spaces suggested by Florida (2002). Perhaps the "global village" promised by McLuhan (1962) consists of communities connecting online around points of shared interest, as in the case of the music venue Interviewee 15 mentioned that attracts bluegrass artists from the USA. Through online connectivity we see the potential for the compression of time and space associated with distance (Agnew, 2001), made possible by rapid, digital communications that transcend geographical location.

Many of our interviewees feel that better broadband could reduce the amount of travel that they have to undertake to maintain and grow their businesses: "If I could get to a position where I could deal with people in London on a conference call video thing … I wouldn't have to be down there the whole time" (Interviewee 2). For many, the distances that they travel are considerable and time consuming. Sustaining collaborations and partnerships with others based in London or other major urban hubs is challenging, particularly for those who have relocated to rural Scotland from a city: "I was doing hundred-mile round trips to do things that take you five minutes on the Internet" (Interviewee 4). Even with minimal connectivity, our interviewees are able to function remotely to some extent thanks to communicating via email – an application of the web that (with the exception of sending large attachment files) does not depend upon fast broadband speeds: "Email … you just get totally hooked into it until you become dependent on it … it lets us work in areas we could have only dreamed of before and saves you a fortune in petrol" (Interviewee 4). Tools such as video conferencing have great potential for those working remotely because they help businesses to avoid the financial and time costs of travelling for face-to-face meetings. However, even for those whose current Internet provision supports data heavy applications such as video conferencing, their use can be hindered by the cost of these tools, as well as the cost of faster broadband packages where available, and differing levels of experience and skills.

For those whose Internet connectivity is poor, the "death of distance" promised by Schwanen and Kwan (2008) does not apply. Instead they must continue to suffer the penalties associated with geographical isolation. For creative practitioners who perceive their current Internet provision to be inadequate for their needs, there is a sense of being remote from clients and collaborators, and equally a feeling that better connectivity would alleviate problems associated with distance. Amongst our interviewees the artist who feels she would be in more regular contact with her international network of peers, allowing her to collaborate more effectively, and the music video producer who believes that her business partnership (with a partner based in London) is suffering because she is unable to use tools for conference calls or online file sharing are examples of businesses suffering a penalty of distance. Some of our interviewees talked about the expectations of their clients and professional peers in relation to working from rural areas. There is a sense that rural remote working is not always encouraged or supported, particularly where there are fears that the technology will not be adequate for delivering products and services: "People like you to be in the city, where they can physically see you. If they can't trust the technology is going to work, you don't get the gig" (Interviewee 4).

Our interviewees felt a growing pressure from clients and

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

collaborators to deliver content via the Internet, often instantly. Particularly for those working with new media such as film, music and photography, there is an expectation of instant delivery of content. This is not unique to the creative industries but creative practitioners perhaps place higher demands on bandwidth in this respect compared with other industries, due to the need to send large files such as high definition video. File sharing makes it possible to do types of work in rural areas that may once have been restricted to urban centres: "The fact that you can be just here on a remote island and distribute stuff everywhere, it's extraordinary really … In both music production and film production, for us to collaborate and ultimately deliver things to our clients, broadband is an absolute essential tool" (Interviewee 10). This again reflects time-space compression (Agnew, 2001). Not only is instantaneous content delivery possible, it is also expected (particularly by those in urban well-connected areas), presenting further challenges for those struggling with poor connectivity.

For a music producer working on a remote island, presenting a professional image is difficult without fast broadband: "it's getting to the point where people would just think you are in the Third world … I try to make it completely invisible that I live here … If you haven't got a fast broadband connection, it's an association people would make – it's like if you can't even send me a file quickly, do they really know what they are doing?" (Interviewee 10). Without a fast connection it can take days to upload content such as high definition video files for clients, who are not always sympathetic to (or unaware of) the poor connectivity associated with rurality. This interviewee relocated to the island where they live at a time when Internet speeds were not too dissimilar to those in urban centres, but over time the connectivity has failed to improve at a rate consistent with urban areas. He feels that if the technology doesn't improve soon: "we'd move probably" (Interviewee 10). This is echoed by other interviewees who talk of the potential need to relocate, such as the light and sound designer who insists: "One way or another I'm going to have to get online because in this creative environment I don't think anyone expects to have to write you a letter any more". (Interviewee 3). This interviewee later relocated to a better-connected location. In contrast, another interviewee is not considering relocating, but instead speaks of giving up her professional creative practice to do something more viable in the area in which she lives: "If we don't have access to that future technology and the way the movement is going then … it's not sustainable, we'd have to do something else" (Interviewee 6).

The fears held by our interviewees of the possible need to relocate contrast starkly with the promise of what broadband connectivity could bring to rural communities. Amongst our interviewees there is a sense that technology can enable new economic activities in economically and sometimes demographically fragile rural communities. The opportunity for creative professionals to move into an island community could in turn invigorate the social and economic sustainability of that area: "In [name of island] we've got empty houses … you could advertise, even if it's for freelance people, come and live on the island … live here, experience it, come and do design work. Without the broadband you probably couldn't do that" (Interviewee 10). This contrasts sharply with the possibility of these practitioners relocating to other areas. This does not only impact upon themselves and their families - there are also socio-economic implications for the local community and economy, particularly in fragile rural communities which suffer from fluctuating populations and the threat of the closure of local services when populations drop below a certain size. One interviewee points out the value of having a variety of industries and professions represented in the local community, and how this might be affected if the technology does not support those professionals:

> *"… if people are leaving the area when they are people who are putting money in the area … although we love it here you end up saying the cons outweigh the pros at the end of the day … if you start losing people who are working within the community and stuff it becomes a dying area, or an area with only one type of people, it would just be farmers in the area" (Interviewee 2).*

Broadband then is a double-edged sword: for rural creative practitioners it can be supportive in reducing the penalty of distance and connecting them to their professional peers, allowing them to grow and compete with their urban counterparts. But when the technology does not allow them adequate connectivity to online communities and tools, it places them at a competitive disadvantage and makes it increasingly difficult to operate from rural locales.

7. Conclusions

Broadband connectivity potentially enables the development of the creative economy in areas previously considered too geographically remote from urban creative hubs to participate in this sector. It reduces the penalty of distance by shrinking time and space (Agnew, 2001; Schwanen and Kwan, 2008) and enables collaboration with remote partners and peers, by connecting people and providing access to appropriate knowledge and resources (Premkumar and Roberts, 1999). Yet this promise of connectivity contrasts starkly with the lived reality of many of our interviewees. For those with limited or inadequate broadband connectivity, the penalty of distance is all too real – made worse by their inability to connect with online communities of practice and isolating them from current ideas, knowledge and opportunities in their industry as well as isolating them from potential clients and audiences (Gibson et al., 2010). Our analysis suggests that for the creative economy to grow in – and contribute to – rural areas, broadband connectivity is essential. Rural creative enterprises need good broadband infrastructure if they are to remain viable. Our findings suggest that connectivity of *at least* 2 Mbps is necessary at present for them to connect with their peers, and in order to market their products and services to a wider audience, potentially reaching national or even international markets, as opposed to limited local markets. Importantly, we note the inevitability of this minimum required speed becoming higher as speeds continue to improve in better-connected areas. Indeed, Ofcom now recommend a minimum speed of 10Mbps for satisfactory Internet use. Increasingly, and particularly marked within the creative industries, practitioners are expected to deliver content online, some of which consists of data-heavy files such as HD video, music and photography. This activity requires broadband speeds greater than 2 Mbps, suggesting that for the rural creative economy to flourish, investment in better broadband (particularly via fibre-optic technologies) is required in rural areas. Yet despite recent efforts by UK Government through their programme to support digital infrastructure upgrades (BDUK, 2011), many rural, particularly remote rural, areas continue to suffer from weaker broadband infrastructure compared to other areas and some areas are not included in the plan to ensure that 95% of households have access to broadband speeds of at least 2 Mbps. Although some improvements have been made to the digital infrastructure in rural areas, there is still a long way to go. Superfast fibre optic broadband infrastructure and 4G mobile networks are being rolled out across the UK, with priority given to urban environments. With far better connection speeds (whether fixed or mobile) now found in urban centres, contrasting with only marginally improving speeds in rural areas, we would argue that

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001

the digital divide is widening rather than narrowing. One implication is that the designers of online services now often assume that everyone has access to these faster connection speeds, subsequently designing applications that are far more data hungry and which magnify the problems of those working with slower connection speeds.

Our research has contributed to the literature and research outlining the state of the digital divide. It has brought insights into digital opportunities and challenges for businesses located in rural areas, particularly for the creative industries. Previous work concerned with the creative industries has tended to be urban-centric. This paper has addressed this bias by moving the topic into a rural domain.

Funding

The research reported here is supported by the award made by the RCUK Digital Economy programme to the dot.rural Digital Economy Hub (award reference: EP/G066051/1).

References

Agnew, J., 2001. The new global economy: time-space compression, geopolitics, and global uneven development. J. World Syst. Res. VII (2), 133–154.
Anderson, L., 2010. Magic light, silver city: the business of culture in Broken Hill. Aust. Geogr. 41 (1), p71–p85.
BDUK, 2011. Programme Delivery Model. Report. Available at: http://www.culture.gov.uk/images/publications/BDUK-Programme-Delivery-Model-vs1-01.pdf.
Bell, D., Jayne, M., 2010. The creative countryside: policy and practice in the UK rural cultural economy. J. Rural Stud. 26 (3), 209–218.
Bosworth, G., 2008. Entrepreneurial in-migrants and economic development in rural England. Int. J. Entrep. Small Bus. 63 (6), 355–369.
Brennan-Horley, C., 2010. Multiple Work Sites and City-wide Networks: a topological approach to understanding creative work. Aust. Geogr. 41 (1), p39–p56.
British Council, 2010. Mapping of the Creative Industries: a Toolkit. British Council, London.
Burgess, S.J., 2008. England's Rural Areas: Steps to Release Their Economic Potential. Commission for Rural Communities, Cheltenham.
Burnett, R., Marshall, D., 2003. Web Theory: an Introduction. Routledge, New York.
Castells, M., 1996. The Rise of the Network Society, the Information Age: Economy, Society and Culture, vol. I. Oxford, UK: Blackwell, Cambridge, MA.
DCMS Creative Industries Task Force, 1998. Creative Industries: Mapping Document. DCMS, London.
DiNucci, D., 1999. Fragmented futures. Print 53 (4), 32.
Drake, G., 2003. 'This place gives me space': place and creativity in the creative industries. Geoforum 34, p511–p524.
EU Commission, 20.04.2009. DG-INFSO (2009). COM(2009)184 Final.
Eversole, R., 2005. Challenging the creative class: innovation, "creative regions" and community development. Australas. J. Reg. Stud. 11 (3), p351–p360.
Felton, E., Collis, C., Graham, P., 2010. Making Connections: creative industries networks in outer-suburban locations. Aust. Geogr. 41 (1), 57–70.
Florida, R., 2002. The Rise of the Creative Class: and How It's Transforming Work, Leisure, Community and Everyday Life. Basic Books.
Galloway, L., 2007. Can broadband access rescue the rural economy? J. Small Bus. Enterp. Dev. 14 (4), 641–653.
Gibson, C., 2002. Rural transformation and cultural industries: popular music on the New South Wales Far North Coast. Aust. Geogr. Stud. 40 (3), p337–p356.
Gibson, C., 2010. Creative geographies: takes from the 'margins'. Aust. Geogr. 41 (1), p1–p10.
Gibson, C., Luckman, S., Willoughby, J., 2010. Creativity without Borders? Rethinking remoteness and proximity. Aust. Geogr. 41 (1), p25–p38.
Grimes, S., 2003. The digital economy challenge facing peripheral rural areas. Prog. Hum. Geogr. 27 (2), 174–193.
Heenan, D.A., 1991. The New Corporate Frontier: the Big Move to Small Town, USA. McGraw-Hill, New York, NY.
Herslund, Lise, 2012. The rural creative class: counterurbanisation and entrepreneurship in the Danish countryside. Sociol. Rural. 52.2, 235–255.
Hoyman, M., Faricy, C., 2009. It takes a village: a test of the creative class, social capital and human capital theories. Urban Aff. Rev. 44, p311–p333.
Jedrej, C., Nuttall, M., 1996. White Settlers. The Impact of Rural Repopulation in Scotland. Routledge, London and New York.
Kazana, V., Kazaklis, A., 2009. Exploring quality of life concerns in the context of sustainable rural development at the local level: a Greek case study. Reg. Environ. Change 9 (3), 209–219.
LaRose, R., Gregg, J., Strover, S., Straubhaar, J., Carpenter, S., 2007. Closing the rural broadband gap: promoting adoption of the internet in rural America. Telecommun. Policy 31 (6–7), 359–373.
Leadbetter, C., Oakley, K., 1999. The Independents: Britain's New Cultural Entrepreneur. Demos, London.
Malecki, E.J., 2003. Digital development in rural areas: potentials and pitfalls. J. Rural Stud. 19, 201–214.
Markusen, A., 2007. A consumption base theory of development: an application to the rural cultural economy. Agric. Resour. Econ. Rev. 36, p9–p23.
Mayes, R., 2010. Postcards from Somewhere: 'marginal' cultural production, creativity and community. Aust. Geogr. 41 (1), p11–p23.
McGranahan, D.A., Wojan, T.R., 2007. Recasting the creative class to examine growth processes in rural and urban counties. Reg. Stud. 41 (2), p197–p216.
McGranahan, D.A., Wojan, T.R., Lambert, D.M., 2011. The rural growth trifecta: outdoor amenities, creative class and entrepreneurial context. J. Econ. Geogr. 11, p529–p557.
McHenry, J.A., 2011. Rural empowerment through the arts: the role of the arts in civic and social participation in the Mid West region of Western Australia. J. Rural Stud. 27, p245–p253.
McLuhan, M., 1962. The Guttenberg Galaxy. University of Toronto Press, Toronto.
Oakley, K., 2004. Not so cool britannia: the role of the creative industries in economic development. Int. J. Cult. Stud. 7 (1), p67–p77.
Ofcom, 2011. Communications Market Report: UK. Report. Retrieved from: http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr11/uk/.
Office for National Statistics, 2011. Rural and urban areas: comparing lives using rural/urban classifications. Reg. Trends 43, 2010/2011.
Philip, L.J., Brown, D., Stockdale, A., 2012. Demographic ageing in rural areas: insights from the UK and US. In: Shucksmith, M., Brown, D., Warner, M., Vergunst, J., Shortall, S. (Eds.), Rural Transformations and Policies in the UK and US. Routledge, pp. 58–78.
Philip, L.J., Cottrill, C., Farrington, J., 2015. 'Two-speed' Scotland: patterns and implications of the digital divide in contemporary Scotland. Scott. Geogr. J. 131 (3–4), 148–170.
Premkumar, G., Roberts, M., 1999. Adoption of new information technologies in rural small businesses. Omega Int. J. Manag. Sci. 27, 467–484.
Roberts, E., Townsend, L., 2015. The contribution of the creative economy to the resilience of rural communities: exploring cultural and digital capital. Sociol. Rural. http://dx.doi.org/10.1111/soru.12075. Early View Online:
Royal Society of Edinburgh, 2014. Spreading the Benefits of Digital Participation. Royal Society of Edinburgh, Edinburgh.
Schwanen, T., Kwan, M.P., 2008. The Internet, mobile phone and space-time constraints. Geoforum 39, p1326–p1377.
Scottish Government, 2012. Scottish Government Urban Rural Classification 2011-2012. August 2012.
Skerratt, S., Warren, M., 2003. Broadband in the countryside: the new digital divide. In: EFITA 2003 Conference, 5–9 July 2003, Debrecen, Hungary.
Sorensen, T., 2009. Creativity in rural development: an Australian response to Florida (or a view from the fringe). Int. J. Foresight Innov. Policy 5 (1–3), 24–43.
Townsend, L., Sathiaseelan, A., Fairhurst, G., Wallace, C., 2013. Enhanced broadband access as a solution to the social and economic problems of the rural digital divide. Local Econ. 28 (6), 580–595.
Townsend, L., Wallace, C., Smart, A., Norman, T., 2016. Building virtual bridges: how rural micro-enterprises develop social capital in online and face-to-face settings. Sociol. Rural. 56 (1), 29–47.
Velaga, N.R., Beecroft, M., Nelson, J.D., et al., 2012. Transport poverty meets the digital divide: accessibility and connectivity in rural communities. J. Transp. Geogr. 21, 102–112.
Warren, A., Evitt, R., 2010. Indigenous Hip-hop: overcoming marginality, encountering constraints. Aust. Geogr. 41 (1), p141–p158.
Wenger, E., White, N., Smith, J.D., 2009. Digital Habitats: Stewarding Technologies for Communities. CPSquare, Portland, Oregon.
White, P., 2010. Creative industries in a rural region: *Creative West*: the creative sector in the Western region of Ireland. Creat. Ind. J. 3 (1), p79–p88.
Winters, L.A., Martins, P.M.G., 2004. When comparative advantage is not enough: business costs in small remote economies. World Trade Rev. 3 (3), 347–383.
Wojan, T.R., Lambert, D.M., McGranahan, D.A., 2007. Emoting with their feet: bohemian attraction to creative milieu. J. Econ. Geogr. 7, p711–p736.

Please cite this article in press as: Townsend, L., et al., Broadband and the creative industries in rural Scotland, Journal of Rural Studies (2016), http://dx.doi.org/10.1016/j.jrurstud.2016.09.001